REMARKS

Claims 1-9 and 11-16 are pending in the present application. Claim 4 has been amended for clarity. As set forth in the Request for Reconsideration filed on March 31, 2003, it is noted that the Office Action finally rejecting the claims does not specifically reject claims 1-9, but merely states that the arguments previously presented are not deemed persuasive. For the purposes of this response, it is assumed that the prior rejection of claims 1-9 is maintained as set forth in the Office Action dated November 23, 2001.

At the outset, it is noted that in the Advisory Action dated April 9, 2003, it is stated that the arguments presented in the Request for Reconsideration filed March 31, 2003, did not particularly point to claimed limitations that are relied upon. It is respectfully submitted that this characterization of the arguments presented is not correct. The arguments presented in the Request for Reconsideration specifically pointed out the expressly recited claim features relating to which computer, the sending computer or the receiving computer, performed which tasks, and the advantages achieved thereby. The following remarks will endeavor to even more clearly enumerate the specific claim limitations being relied upon.

The rejection of claims 1-3 and 11-16 under 35 U.S.C. §103(a) over Pyne (U.S. Patent No. 5,721,907) in view of Carson (U.S. Patent No. 5,978,805) is respectfully traversed.

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As will be explained in more detail below, the Examiner appears to have overlooked the fact that applicant's claimed invention requires distribution of workload to the numerous plurality of receiving computers and is otherwise also much more efficient than the approaches taught by either of the cited references (or any conceivable combination of them). It will be noted that the pending claims specifically recite that the *receiving* computer performs comparisons and constructs the target file. In other words, it is the receiving computer that performs the computationally intensive tasks that were previously performed at the *source* computer (as evidenced by the references being relied upon in the Office Action). In particular, claim 1 recites in steps iii and v that the receiving computer performs the comparison and constructs the target file; claim 4 recites in steps ii and iv recites that the first computer (*i.e.*, the receiving computer) performs the comparison and constructs the target file; claim 7, in steps iii and v recites that the receiving computer performs the comparison and constructs the target file; likewise, claim 11 specifically recites that the receiving computer performs the comparison and constructs the target file; and claim 14 also expressly recites that receiving computer performs the computation of reference key values in steps iii and v, and the receiving computer constructs the target file in step viii. The foregoing are examples of specifically recited claim features being relied upon to support the arguments in favor of patentability and distinguishing the prior art being relied upon in the Office Action.

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Turning now to an overview of the exemplary features of the present invention, the claimed invention relates to a file synchronization process where a source file at a sending computer is arranged into a sequence of data blocks, each block comprising a predetermined number of data units. A source key value is computed for each block in the source file, and these values are transmitted from the sending computer to the receiving computer. At the receiving computer, reference key values are computed for each predetermined number of contiguous data units in the reference file, and these are compared with the source key values to determine matches between source key values and reference key values. An indication of which source keys do not have matching reference keys is communicated from the receiving computer to the sending computer. In response, the sending computer transmits data blocks corresponding to the unmatched source keys from the source file to the receiving computer. The receiving computer then constructs a target file that is synchronized with the source file at the sending computer from the contiguous data units in the reference file determined to have reference key values matching respective source key values and the data blocks from the source file received from the sending computer.

In complete contrast to the specifically recited features of the claimed invention, Pyne discloses a file synchronization method whereby a reference file on a *receiving* computer is divided into n-byte data blocks, and a reference key value is associated with each block. The reference key values are transmitted from the receiving computer to the

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sending computer. *At the sending computer*, an n-byte block of data in the source file is identified and a source key value is computed for the block. The source key value is compared to the reference key values. If a match is found, an indication of the match is sent from the sending computer to the receiving computer and is used to copy the corresponding block from the reference file to a destination file. If a match is not found, the first byte of the non-matching source file block is sent from the sending computer to the receiving computer, a new n-byte block of data in the source file is identified offset by 1-byte relative to the non-matching block, and a new source key value is computed for the new block. The source key value is compared to the reference key values as described above, and these steps are repeated until the end of the source file is reached. The destination file thus created is synchronized with the source file.

Carson discloses a file synchronization method whereby a reference file on a destination (*i.e.*, destination) computer is divided into reference data blocks having a preselected length. Reference key values representing reference blocks of data from the reference file are generated by the destination computer and sent to the source computer. An offset location *at the source computer* is initialized to point to the start of the source file. *The source computer* compares a portion of each reference key, referred to as a feature, with portions of the source file. When a feature match is found, a checksum of the reference block (also included in the reference key) is compared with a checksum of the source block. If the checksums also match, then the blocks match. If the matching

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source block was not found at the current offset location of the source file, then the intervening portion of the source file located before the matching block is sent to the destination computer for inclusion in the synchronized file. A message is then sent to the destination computer so that the matching reference block can be copied from the reference file to build the synchronized file. The offset location at the source computer is updated to point to the end of the matching source block. These steps are repeated until the synchronized file on the destination computer is identical to the source file on the source computer.

A fundamental difference between the systems disclosed by Pyne and Carson and that of the claimed invention lies in the location of processing associated with synchronization. In particular, the processing overhead associated with the synchronization method of both Pyne and Carson occurs *at the source computer*. The claimed invention specifically recites that this processing occurs *at the receiving computer*. In this regard, the references to Pyne and Carson are inapposite to the claimed invention, and specifically teach away from the claimed solution. As such, both Pyne and Carson are inapplicable to the claims.

The Office Action alleges that Pyne teaches at the receiving computer, comparing the source key values with reference key values computed for each predetermined number of contiguous data units in the reference file to determine matches between source key values and reference key values (*see*, November 23, 2001 Office Action at

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page 4, citing Abstract, Col. 2, lines 25-32 and Col. 5, lines 37-48). This allegation is simply incorrect and contrary to the plain teachings of Pyne. In particular, the Abstract specifically states "*At the sending computer*, a block of data at the source file is identified, its key value computed, and the key value is then compared to the keys in the array." Abstract, lines 11-13 (emphasis added). The sending computer is the source computer, *not* the receiving computer. Thus, Pyne requires *the sending computer* to perform the computationally burdensome activities associated with the matching of data blocks.

In complete contrast, the claimed invention does the *opposite*. Namely, the claimed invention performs the burdensome computational tasks (such as those specifically enumerated above for the Examiner's convenience) *at the receiving computer*. Thus, the reference file, rather than the source file, is searched for matching blocks. In a typical file server arrangement, there are many receiving computers but only one sending computer. Thus, off-loading the computational overhead from the source (or sending) computer to the receiving computer provides significant improvement over such systems and alleviates the burdens on the source computer. There is no teaching, suggestion or recognition of this novel and unobvious improvement over the cited art.

Carson suffers from the same fundamental deficiencies of Pyne with respect to processing at the sending computer as opposed to the receiving (or destination) computer.

Accordingly, Carson fails to remedy this fundamental deficiency of Pyne. For this reason alone, the combination of Pyne and Carson fail to render the claimed invention obvious.

With respect to claim 2, the Office Action, once again, is incorrect in its allegation of what Pyne teaches. Specifically, the Office Action alleges that Pyne teaches the source key values for the sequence of source file data blocks are pre-computed and stored for subsequent use (see November 23, 2001 Office Action, page 6, citing Col. 4, lines 1-4). However, a careful reading of this section of Pyne reveals that Pyne is teaching storing of *computer program controls* that are executed by the processing units of each computer. Contrary to the allegations in the Office Action, this is *not* a teaching or suggestion of pre-computing and storing source key values.

In view of the foregoing, it is respectfully submitted that neither Pyne nor Carson, either singly, or in combination, disclose, teach or suggest the features of the claimed invention. In particular, neither of the references disclose or suggest performing comparisons at the receiving computer. In fact, both references teach the opposite, and thus clearly and specifically teach away from the solution of the claimed invention. Therefore, even if, *arguendo*, the combination of Pyne and Carson were proper, the combination nevertheless fails to render the claimed invention obvious. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

The rejection of claim 4 under 35 U.S.C. §102(e) over Carson is respectfully traversed.

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Carson deals with the problem of constructing, at a first computer having a reference file, a synchronized copy of a source file stored on a remote second computer by identifying which parts of the source file and the reference file are identical and only transferring those parts of the source file that differ. The Office Action alleges that step i) of the claim is disclosed or suggested by reference to Col. 2, lines 46-62, Col. 3, lines 14-27 and Col. 5, lines 17-29. This recitation states that the source file is searched for a group of data units that match the feature. This method requires searching on the sending computer using a high-demand computational resource, and differs from the method of claim 4, which does not require such searching.

Moreover, as with the rejection of claims 1-3, claim 4 is directed to a method in which the target data file is constructed on the receiving computer (see preamble). Step ii recites that the first computer (*i.e.*, the *receiving* computer) performs the comparison of reference key values with the source key values. In addition, step iv recites that the target file is constructed at the first computer (*i.e.*, the *receiving* computer).

It is axiomatic that in order for a reference to anticipate a claim, the reference must disclose, teach or suggest each and every feature of the claimed invention. As set forth above, Carson fails to disclose, teach or suggest each and every feature of the claimed invention. In particular, Carson fails to disclose, teach or suggest that the receiving computer performs the claimed comparisons. Accordingly, Carson fails to anticipate the

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claimed invention. Therefore, reconsideration and withdrawal of the rejection are respectfully requested.

The rejection of claims 5 and 6 under 35 U.S.C. §103(a) over Carson in view of Mattis et al. (U.S. Patent No. 6,289,358, hereinafter "Mattis") is also respectfully traversed.

It is respectfully submitted that Mattis fails to overcome the deficiencies of Carson as set forth above. Thus, the combination of Mattis and Carson fails to render the claimed invention obvious.

Specifically, Mattis discloses a method for caching and delivering an alternate version of a requested object from a proxy web server on the worldwide web. Alternate versions include different translations of a document, and different versions (e.g., resolutions, colors, etc.) of an image for different web browsers.

With respect to claim 5, the Office Action cites to Carson's col. 6, lines 14-26. However, this does not relate to source key values at all, but instead describes the exchange of CRC messages relating to memory resource allocation and is specific to details of Carson's method. In any case, as described above, Carson teaches generating and sending key values for the reference file, not the source file.

The Office Action goes on to allege that Mattis teaches a method for caching and delivering an alternate version from among a plurality of alternate versions. It is

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respectfully submitted that Mattis' method for delivering an alternate version is not applicable here.

It is respectfully submitted that the methods of claims 5 and 6 are not obvious in relation to synchronizing files by delivering differences only. A proxy cache computer cannot be interposed in either of the methods of Pyne or Carson without the proxy computer becoming a full replica of the sending computer. In contrast, the methods of claims 5 and 6 provide the advantage of enabling a proxy cache computer which is not a full replica of the sending computer, and may never have a complete copy of any of the source files, to improve data throughput and reduce load on the sending computer.

In any event, Mattis fails to overcome the deficiencies noted above with respect to Carson. Therefore, even if, *arguendo*, the combination of Carson and Mattis were proper, the combination nevertheless fails to render the claimed invention obvious. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

The rejection of claims 7, 8 and 9 under 35 U.S.C. §103(a) over Pyne, Carson and Mattis is also respectfully traversed.

As with the rejection of claims 1-3, no objective teaching in the prior art has been provided to overcome the fundamental deficiencies noted above with respect to Pyne and Carson. In particular, neither Pyne nor Carson disclose or suggest performing comparisons at the *receiving* computer. In fact, both references teach the *opposite*, and

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thus clearly and specifically teach away from the solution of the claimed invention. Moreover, Mattis provides no objective teaching to overcome the fundamental deficiencies of Pyne and Carson. Therefore, even if, *arguendo*, the combination of Pyne, Carson and Mattis were proper, the combination nevertheless fails to render the claimed invention obvious. Accordingly, reconsideration and withdrawal of the rejections are respectfully requested.

The rejection of claims 11-16 under 35 U.S.C. §103(a) over Pyne in view of Carson is respectfully traversed.

As with the rejection of claims 1-3 above, it is respectfully submitted that neither Pyne nor Carson disclose, teach or suggest performing the claimed comparisons at the *receiving* computer. Instead, both of these references teach the *opposite*, *i.e.*, performing comparisons at the source or sending computer. Thus, the cited references not only teach away from the solution of the claimed invention, they cannot, either singly or in combination achieve the advantages of the claimed invention. This deficiency of the prior art is fundamental. Therefore, even if, *arguendo*, the combination of Pyne and Carson were proper, the combination nevertheless fails to render the claimed invention obvious. Moreover, there is no motivation to modify the combination of references to achieve the claimed invention, absent impermissible hindsight. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

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In view of the foregoing, the entire application believed to be in condition for allowance. Favorable reconsideration of the application and prompt allowance of the claims are earnestly solicited.

Should the Examiner deem that further issues require resolution prior to allowance, the Examiner is invited to contact the undersigned attorney of record at the telephone number set forth below.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____
Updeep S.Gill
Reg. No. 37,334

USG:dbp
1100 North Glebe Road, 8th Floor
Arlington, VA 22201-4714
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

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